

Jpn. J. Ent., 63(2): 399–411. June 25, 1995

Deraeocoris kimotoi MIYAMOTO and its Allies of
Japan, with Description of a New Species
(Heteroptera: Miridae)

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Abstract Four Japanese plant bugs, *D. kimotoi* MIYAMOTO, 1965, *D. kerzhneri* JOSIFOV, 1983, *D. pallidicornis* JOSIFOV, 1983, *D. salicis* JOSIFOV, 1983 and *D. yasunagai* sp. nov., are described and/or redescribed; *D. salicis* is recorded from Japan for the first time. Taxonomic characters of the four species are discussed.

Key words: Heteroptera; Miridae; *Deraeocoris*; new species; morphology; Japan.

Introduction

The genus *Deraeocoris* KIRSCHBAUM, 1855, of the subfamily Deraeocorinae is distributed throughout the world containing some 200 species which are conspicuously variable in shape and the male genital structure. Although five subgenera have been established under *Deraeocoris* (WAGNER 1952, 1963; LINNAVUORI 1975), previous subgeneric classifications are unsatisfactory and they should be totally revised. In fact, among 10 known species from Japan, subgeneric status of *D. kimotoi* MIYAMOTO, 1965 has been unclarified.

On the other hand, *kerzhneri* (= *pallidus* HORVÁTH, 1905), *pallidicornis* and *salicis* described by JOSIFOV (1983) from North Korea show close relationship to *kimotoi* in the configuration of parameres and vesica of male genitalia. Though JOSIFOV (1983) placed these three species into the subgenus *Deraeocoris* which includes *olivaceus* (=type species of the genus) etc., they represent a distinct species group which is not applied to the current subgeneric classification.

In the present paper, these four species and a new species described here are provisionally regarded as a species group. Some new terms for sclerites of the vesica are proposed. A key to the species of the group is provided.

All measurements in the text are given in millimeters. The following abbreviations are used to indicate the depository of the specimens examined in institutional collections. NIAES: National Institute of Agro-Environmental Science, Tsukuba, Ibaraki; NSMT: Department of Zoology, National Science Museum, Tokyo; OMNH: Osaka Museum of Natural History, Osaka; UOP:

University of Osaka Prefecture, Sakai, Osaka.

Taxonomic Characters

The following characters were recognized among the five species treated here and found to be useful for the determination of species. JOSIFOV (1983) gave the German names for the sclerites of vesica of these species, while they are not generally used by recent authors (CARVALHO, 1985; KERZHNER, 1988). Thus, I propose new terminology for the vesical sclerites of these species.

Head. The head is long, accompanying the horizontal vertex, and slightly pubescent. Usually, the coloration is entirely reddish or yellowish brown. The vertex is sometimes tinged with red (*kimotoi*) or green (*salicis*).

Antenna. The antenna is relatively long and the proportions of each segments is mostly uniform within the five species. The segment II of male is slender as in female; in some species of *Deraeocoris* the segment II is inflated.

Labium. The labium is reaching the middle coxae. The segments I–III are almost equal in length, and the segment IV is longer than the others.

Prothorax. The pronotum is distinctly punctate except for smooth callus and uniformly reddish or pale yellowish brown provided with suberect pubescence along lateral margins. The surface of the pronotal collar is smooth and shiny in the five species; in some species of *Deraeocoris*, it is liable to be shagreened.

Scutellum. The scutellum is not punctate and usually pale yellowish or reddish brown without markings.

Hemelytra. In these five species, the hemelytra is semitransparent or transparent, and the punctures are not darkened. The coloration is mostly uniform except *kerzhneri* and *yasunagai* sp. nov. which are partly infusate. The lateral margin of hemelytra is strongly wavy and extended basally in the five species.

Legs. The legs are usually pale reddish or yellowish brown with reddish or brownish markings. The tarsomere I–II are almost equal in length and III is somewhat longer than the others.

Male genitalia. The male genitalia of these five species exhibit unique structure within the genus. The left paramere has relatively narrow sensory lobe accompanying a triangular protuberance; the hypophysis is weakly curved and tapering, and bearing with a small hook apically (Figs. 1A & 1B). The right paramere is slender and weakly twisted (Fig. 1C).

The vesica (Fig. 1D) is composed of membranous lobes and five sclerites which are composed of a long needle-shaped sclerite and four broad or thin sclerites. The former structure is called *spicule* (*sp*) (WAGNER et WEBER, 1966) (=spiculum of KELTON, 1959, spiculum of JOSIFOV, 1983). The latter

four are termed here *apical sclerite* (*as*), *lateral sclerite* (*ls*), *median sclerite* (*ms*) and *basal sclerite* (*bs*) (=dornartiger Anhang, kammartiger Anhang, grobzähniger Anhang and kleinzähniger Anhang of JOSIFOV, 1983).

These five vesical sclerites are recognized in all the five species. The lateral sclerite is usually comb-shaped with large pointed spines. The basal sclerite is sometimes reduced. These sclerites are useful not only for distinguishing species but also for defining the species group.

As mentioned above, the species treated here are characterized by the extended hemelytra, triangular protuberance of the sensory lobe of the left paramere and structure of the vesica which accompanies five sclerites.

Key to *Deraeocoris kimotoi* and its allied species of Japan

1. Body dark red, with reddish scutellum*kimotoi*
— Body pale yellow, sometimes with brown markings; scutellum pale yellow or dark brown2
2. Base of tibia with a brown spot; scutellum dark brown, with paler lateral sides; hemelytra transparent and slightly tinged with green*salicis*
— Base of tibia without a spot, or with an indistinct reddish spot; scutellum yellowish brown; hemelytra semitransparent3
3. Hemelytra uniformly pale yellow and immaculate *pallidicornis*
— Hemelytra with distinct or at least weak markings4
4. Body smaller (4.6–5.7 mm), with a distinct medium stripe on dorsum*yasunagai* sp. nov.
— Body larger (6.3–6.5mm), without such stripe*kerzhneri*

Deraeocoris kimotoi MIYAMOTO, 1965

(Fig. 1)

Deraeocoris kimotoi MIYAMOTO, 1965, 152; MIYAMOTO & YASUNAGA, 1989, 158.

Deraeocoris (*Deraeocoris*) sp.: YASUNAGA *et al.*, 1993, p.146.

Body oval; dorsal surface shiny dark reddish brown, sometimes paler.

Head pale reddish brown, sometimes with red Y-shaped stripe and 2–4 red patches; vertex 0.41 times as wide as head in male, 0.47–0.50 times in female. Antenna pale yellowish brown; segment I irregularly with red portions; apical 1/5 of segment II dark brown; segments III–IV darkened in various degree; each length of segments I–IV as 0.66 : 1.65 : 0.63 : 0.61 in male, 0.69 : 1.70 : 0.74 : 0.61 in female. Labium pale reddish brown. Labrum reaching the middle of labial segment I, reddish brown.

Pronotal collar shiny reddish brown. Pronotum shiny reddish brown; its

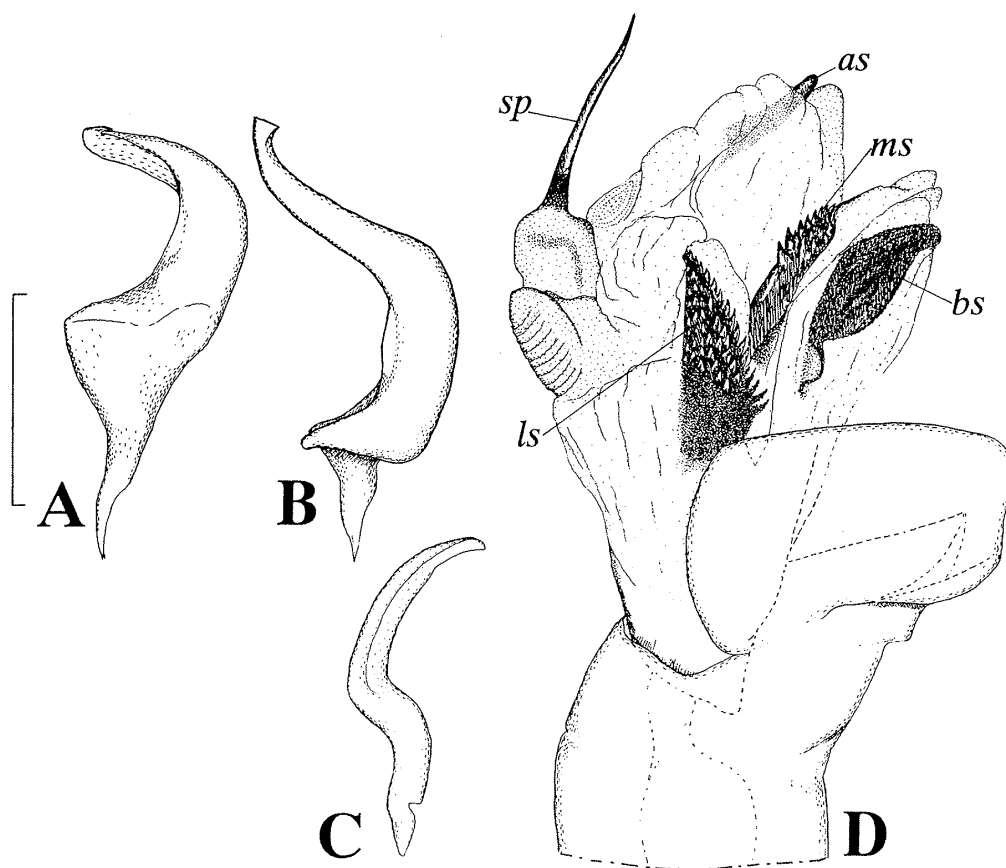


Fig. 1. Male genitalia of *Deraeocoris kimotoi*. A–B, Left paramere; C, right paramere; D, phallus. Scale: 0.3 mm.

basal width 1.32–1.34 times as long as antennal segment II. Scutellum usually shiny pale yellowish brown, sometimes reddish brown tinged with red. Ventral surface of thorax reddish brown, weakly shining; ostiolar peritreme whitish. Hemelytra dark reddish brown with a red stripe along subcostal vein, distinctly punctate; cuneus tinged with red, lateral margin pale. Membrane grayish brown, with a pale hyaline marking beside cuneus; vein reddish. Legs pale yellowish brown; each femur with obscure red rings at apical half; each tibia basally with a small red spot; length of hind femur: tibia: tarsus as 1.91 : 2.38 : 0.55 in male, 1.99 : 2.56 : 0.55 in female; proportion of hind tarsomeres I–III as 15 : 15 : 23 in male, 14 : 14 : 23 in female.

Ventral surface of abdomen shiny reddish brown.

Sensory lobe of left paramere with a triangular protuberance; hypophysis strongly curved, apically with a triangular hook. Right paramere slender, somewhat strongly curved. Spicule long. Apical sclerite with round apex. Lateral sclerite spinulate. Median sclerite relatively small. Basal sclerite winding, with minute spines.

Dimensions. Male: body length 5.2–5.7, head width 0.9–1.0, pronotal width 2.0–2.2 and width across hemelytra 2.5–2.6. Female: 5.1–6.0, 0.9–1.0, 2.2–2.4 and 2.7–3.0, respectively.

Specimens examined. [Ryukyus] 1♂, Setouti Town, Amami-Oshima Is., 1. v. 1977, O. TOMINAGA (OMNH); 3♂, Amagi Town, Tokunoshima, 3. v. 1977, O. TOMINAGA (OMNH); 1♂, Okinawa Is., 3. v. 1953, T. SHIRAKI (NIAES); 2♂, 3♀, Yona, Kunigami Vil., Okinawa Is., 20. v. 1993, Y. NAKATANI (UOP); 2♂, 2♀, 21. v. 1993, 9♂, 2♀, 22. v. 1993, 2♂, 2♀, 23. v. 1993, 2♀, 24. v. 1993, same locality and collector (UOP); 1♀, 20. v. 1993, T. YASUNAGA, same locality (UOP); 2♀, 21. v. 1993, same locality and collector (UOP); 1♀, 23. v. 1993, K. YOSHIZAWA, same locality (UOP); 1♂, 1♀, Mt. Yonahadake, Kunigami Vil., Okinawa Is., 21. v. 1993, Y. NAKATANI (UOP); 1♂, 1♀, Sate, Kunigami Vil., Okinawa Is., 24. v. 1993, same collector (UOP); 1♂, 1♀, K. Yoshizawa, same date and locality (UOP); 1♂, 1♀, Benoki, Kunigami vil., Okinawa Is., 25. v. 1993, Y. NAKATANI (UOP).

Distribution. Japan (Ryukyus; Amami-Oshima Is., Tokunoshima and Okinawa Is.).

This species is easily recognized by the reddish coloration. As mentioned in the original reference by MIYAMOTO (1965), it may be most closely related to a Chinese species, *D. alticallus* HSIAO, from which it is separatable by the relatively broader body, shorter antenna and flat pronotal callus.

Deraeocoris kimotoi has been collected from many kinds of arboreal plants (*Schima liukiuensis*, *Pinus* sp., etc.) and occasionally attracted to light.

Deraeocoris kerzhneri JOSIFOV, 1983

(Fig. 2)

Deraeocoris pallidus HORVÁTH, 1905, 420 (nom. preocc. by REUTER, 1889); MIYAMOTO & YASUNAGA, 1989, 158.

Deraeocoris (*Deraeocoris*) *kerzhneri* JOSIFOV, 1983, 77.

Deraeocoris kerzhneri: KERZHNER, 1988, 795.

Body oval; dorsal surface shiny pale yellowish brown.

Head entirely pale yellowish brown; vertex 0.36 times as wide as head in male, 0.44 times in female. Antenna pale yellowish brown; segment I with two obscure red stripes, and a dark ring at basal 1/10; length of segments I–IV as 0.75 : 2.02 : 0.86 : 0.77 in male, 0.79 : 1.97 : 0.88 : 0.81 in female. Labium pale yellowish brown. Labrum yellowish brown, somewhat short, barely or not reaching the middle of labial segment I.

Pronotal collar shiny yellowish brown. Pronotum shiny yellowish brown, somewhat weakly punctate; its basal width as long as antennal segment II in male, slightly longer in female. Scutellum shiny yellowish brown, with paler

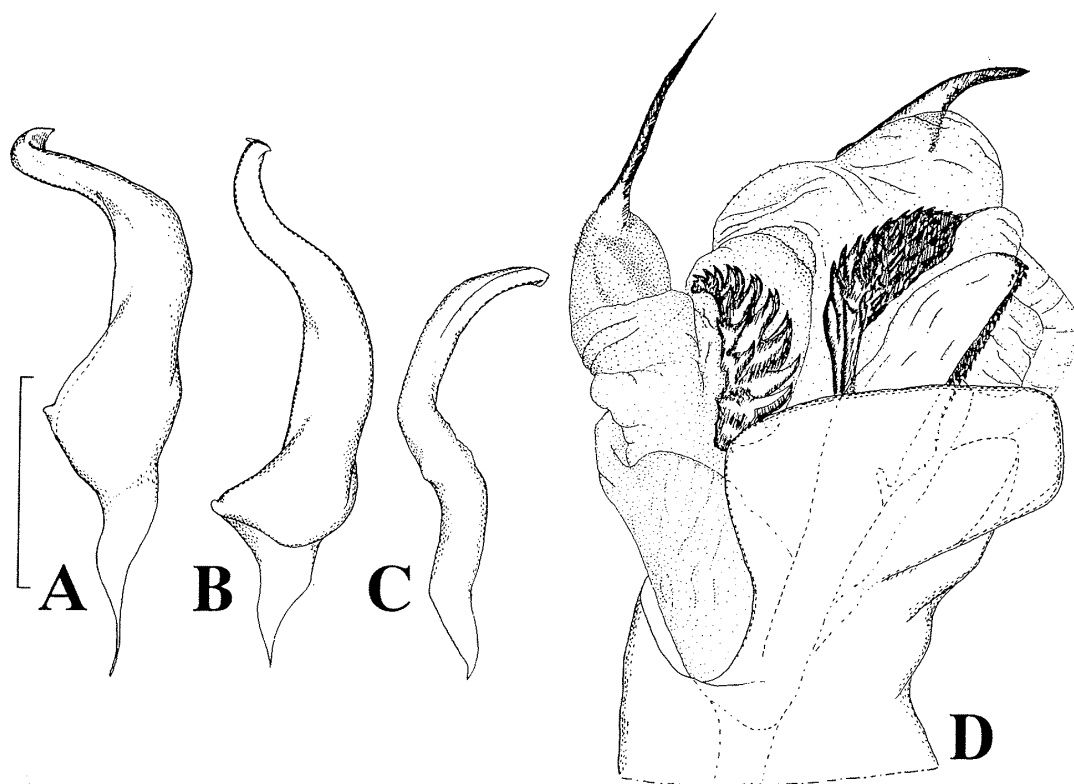


Fig. 2. Male genitalia of *Deraeocoris kerzhneri*. A–B, Left paramere; C, right paramere; D, phallus. Scale: 0.3 mm.

lateral sides. Mesepimeron, mesepisternum and metapleuron somewhat darker than dorsum; ostiolar peritreme pale yellowish brown. Hemelytra pale yellowish brown with red stripes along subcostal vein and lateral side of cuneus; apex of clavus and portion near apex of corium somewhat darker. Membrane pale grayish brown, with red vein. Legs pale yellowish brown; femora partly tinged with red, especially in hind femur; length of hind femur: tibia: tarsus as 2.03 : 2.75 : ? in male, 2.16 : 2.83 : 0.52 in female; proportion of hind tarsomeres I–III as 13 : 14 : 21 in female.

Ventral surface of abdomen shiny reddish brown.

Sensory lobe of left paramere with a small process; hypophysis somewhat strongly curved, apically with a small hook. Right paramere slender, somewhat weakly curved; sensory lobe with several notches. Spicule long. Apical sclerite long, bent, horn-like, with sharp apex. Lateral sclerite with two rows of distinct spine. Median sclerite relatively well-developed, with distinct spines. Basal sclerite narrow, with many minute spines.

Dimensions. Male: Body length 6.3, head width 1.0, pronotal width 2.1 and width across hemelytra 2.4. Female: 6.2, 1.0, 2.2–2.3 and 2.7–2.8, respectively.

Specimens examined. [Hokkaido] 1♂, Shikotsuko, 27–28. vii. 1955, M. OKABE (NIAES). [Honshu] 1♂, 1♀, Oze, Gunma Pref., 6–7. viii. 1956, S. ASAHINA (NIAES); 2♀, Nakabusa, Nagano Pref., 23. viii. 1961, S. TACHIKAWA (NIAES).

Distribution. Japan (Hokkaido, Honshu), Russian Far East, Korea.

This species is especially similar to *D. pallidicornis* JOSIFOV in general coloration, but is distinguished by the larger body size, dark markings on the hemelytra and different form of the male genitalia.

Deraeocoris pallidicornis JOSIFOV, 1983

(Fig. 3)

Deraeocoris (Deraeocoris) pallidicornis JOSIFOV, 1983, 77.

Deraeocoris pallidicornis: KERZHNER, 1988, 795; MIYAMOTO & YASUNAGA, 1989, 158.

Body oval; dorsal surface shiny pale yellowish brown.

Head entirely pale yellowish brown; vertex 0.40 times as wide as head in male, 0.47 times in female. Antenna pale yellowish brown; segment I with a dark ring at basal 1/10, sometimes partly tinged with red; length of segments I–IV as 0.63 : 1.42 : 0.65 : 0.63 in male, 0.64 : 1.56 : 0.67 : 0.61 in female. Labium pale yellowish brown. Labrum yellowish brown, short, barely or not reaching the middle of labial segment I.

Pronotal collar shiny yellowish brown. Pronotum shiny yellowish brown; its basal width 1.26 times as long as antennal segment II in male, 1.32 times in female. Scutellum shiny yellowish brown, with paler lateral sides. Mesepimeron, mesepisternum and metapleuron somewhat darker than dorsum; ostiolar peritreme pale yellowish brown. Hemelytra pale yellowish brown, red stripes along subcostal vein and lateral side of cuneus, somewhat weakly punctate. Membrane pale grayish brown, with red vein. Legs pale yellowish brown; hind femur with a transverse red ring at apical 1/3; length of hind femur: tibia: tarsus as 1.58 : 1.96 : 0.44 in male, 1.77 : 2.26 : ? in female; proportion of tarsomeres I–III as 13 : 13 : 18 in male.

Ventral surface of abdomen shiny reddish brown.

Sensory lobe of left paramere with a triangular protuberance; hypophysis somewhat thick and flat, strongly curved, apically with a sharp hook. Right paramere slender, somewhat weakly curved. Spicule relatively short. Apical sclerite short, with round apex. Lateral sclerite with a row of distinct spines. Median sclerite relatively small, with distinct spines. Basal sclerite narrow, sparsely with minute spines.

Dimensions. Male: body length 4.5–4.7, head width 0.9, pronotal width 1.8–1.9 and width across hemelytra 2.1–2.3. Female: 5.2, 0.9, 2.0–2.1 and 2.4,

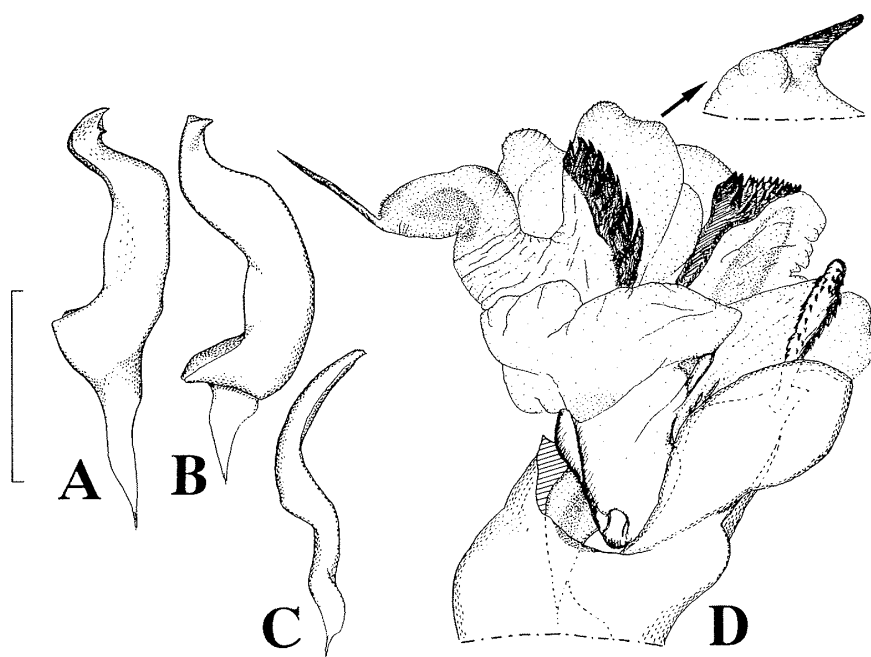


Fig. 3. Male genitalia of *Deraeocoris pallidicornis*. A-B, Left paramere; C, right paramere; D, phallus. Scale: 0.3 mm.

respectively.

Specimens examined. [Honshu] 2♂, Mt. Takao, Tokyo Pref., 27. vii. 1955, K. SADANAGA (NIAES); 1♀, 27. vii. 1955, Y. UTSUGI, same locality (NIAES); 1♂, 12. vii. 1961, K. MIZUSAWA, same locality (NIAES); 1♂, Mizonokuchi, Kanagawa Pref., 18. vii. 1954, T. KIMURA (NIAES); 1♂, Son-enji, Hirakata City, Osaka Pref., 29. ix. 1993, Y. NAKATANI (UOP); 1♀, Mt. Iwawaki, Osaka Pref., 13. vii. 1958, Y. HAMA (OMNH).

Distribution. Japan (Honshu), Russian Far East, Korea.

The ecology of this species is not clarified, but it has been collected from *Quercus* sp. (JOSIFOV, 1983) and *Q. serrata* (MIYAMOTO, pers. comm.).

Deraeocoris salicis JOSIFOV, 1983

(Fig. 4)

Deraeocoris (*Deraeocoris*) *salicis* JOSIFOV, 1983, 81.

Deraeocoris salicis: KERZHNER, 1988, 795.

Body oval; dorsal surface shiny pale whitish yellow, somewhat tinged with green.

Head pale yellowish brown, slightly tinged with green; vertex 0.38 times as wide as head in male, about half in female. Antenna reddish brown; segment

I with a dark ring at basal 1/10, sometimes partly tinged with red; segments II–IV somewhat paler, slightly darkened apically; length of segments I–IV as 0.67 : 1.80 : 0.63 : 0.63 in male, 0.66 : 1.75 : 0.62 : 0.61 in female. Labium pale yellowish brown. Labrum yellowish brown, short, scarcely reaching the middle of labial segment I.

Pronotal collar shiny yellowish brown. Pronotum shiny yellowish brown, somewhat greenish, sometimes with dark spots on both lateral sides of calli; its basal width 1.18 times as long as antennal segment II in male, 1.23 times in female. Scutellum shiny chestnut brown, with paler lateral sides, sometimes mostly paler. Ventral surface of thorax somewhat dark reddish brown with a dark broad stripe at lateral margin in male, entirely pale yellowish brown in female; ostiolar peritreme pale whitish green. Hemelytra transparent yellowish brown, slightly tinged with green, somewhat weakly punctate; inner margin of clavus narrowly brown, sometimes broader in male. Membrane transparent; vein colorless. Legs pale yellowish brown; in male, apical 1/3 of hind femur with two red rings that is sometimes reduced; length of hind femur: tibia: tarsus as 2.01 : 2.45 : 0.60 in male, 2.01 : 2.47 : 0.60 in female; proportion of hind tarsomeres I–III as 19 : 20 : 26 in male, 18 : 19 : 24 in female.

Ventral surface of abdomen shiny reddish brown in male, pale yellowish

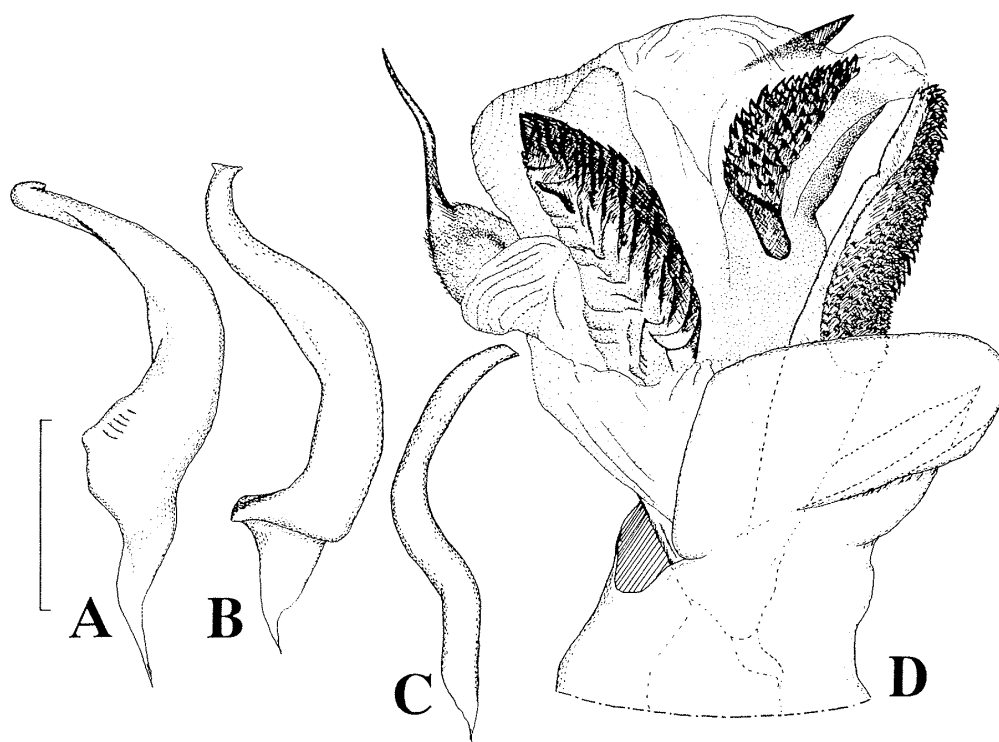


Fig. 4. Male genitalia of *Deraeocoris salicis*. A–B, Left paramere; C, right paramere; D, phallus. Scale: 0.3 mm.

green in female.

Sensory lobe of left paramere with a small process; hypophysis somewhat strongly curved, tapering, weakly hooked. Right paramere slender, weakly curved. Spicule long, weakly bent at middle. Apical sclerite short, with sharp apex. Lateral sclerite long, thick, with a row of distinct spines. Median sclerite well developed, with small spines. Basal sclerite elongate and broad, with many minute spines.

Dimensions. Male: body length 5.4–6.2, head width 1.0–1.1, pronotal width 2.1–2.3 and width across hemelytra 2.4–2.6. Female: 5.7–6.3, 1.0, 2.1–2.2 and 2.6–2.7, respectively.

Specimens examined. [Honshu] 4♂, 3♀, Kizugawa, Yawata City, Kyoto Pref., 9. vii. 1993, T. HIROWATARI (UOP); 42♂, 45♀, 15. vii. 1993, Y. NAKATANI, same locality (UOP).

Distribution. Japan (Honshu; new record), Russian Far East, Korea.

This species is easily distinguished from other Japanese congeners by the greenish coloration, dark marking on scutellum and long lateral sclerite that has a row of large spines.

The specimens examined in this study were all collected from *Salix* sp. with which it seems to be associated.

Deraeocoris yasunagai sp. nov.

(Figs. 5 & 6)

Body oval; dorsal surface pale yellowish brown with, a characteristic dark brownish mesal stripe.

Head entirely shiny pale yellowish brown; vertex 0.42 times as wide as head in male, 0.43–0.54 times in female. Antenna pale yellowish brown; segment I with small reddish spots and with a dark ring at basal 1/5; length of segments I–IV as 0.66 : 1.67 : 0.65 : 0.66 in male, 0.69 : 1.81 : 0.75 : 0.63 in female. Labium pale yellowish brown. Labrum reaching the middle of labial segment I.

Pronotal collar shiny yellowish brown. Pronotum shiny yellowish brown; its basal width as long as antennal segment II or slightly shorter. Scutellum shiny yellowish brown. Ventral surface of thorax reddish brown; metapleuron somewhat darkened; ostiolar peritreme whitish. Hemelytra shiny pale yellowish brown, with dark inner margins of clavus and corium, somewhat weakly punctate; subcostal vein and posterior margin of cuneus reddish. Membrane pale grayish brown with red vein. Legs pale yellowish brown, with a wide red ring at apical half of hind femur; fore and middle femora, apically with red stripes; each tibia with red stripe at outside; length of hind femur: tibia: tarsus as 1.43 : 1.98 : 0.37 in male, 1.77 : 2.27 : 0.48 in female; proportion of hind tarsomere I–III as 13 : 14 : 17 in male, 14 : 15 : 19 in female.

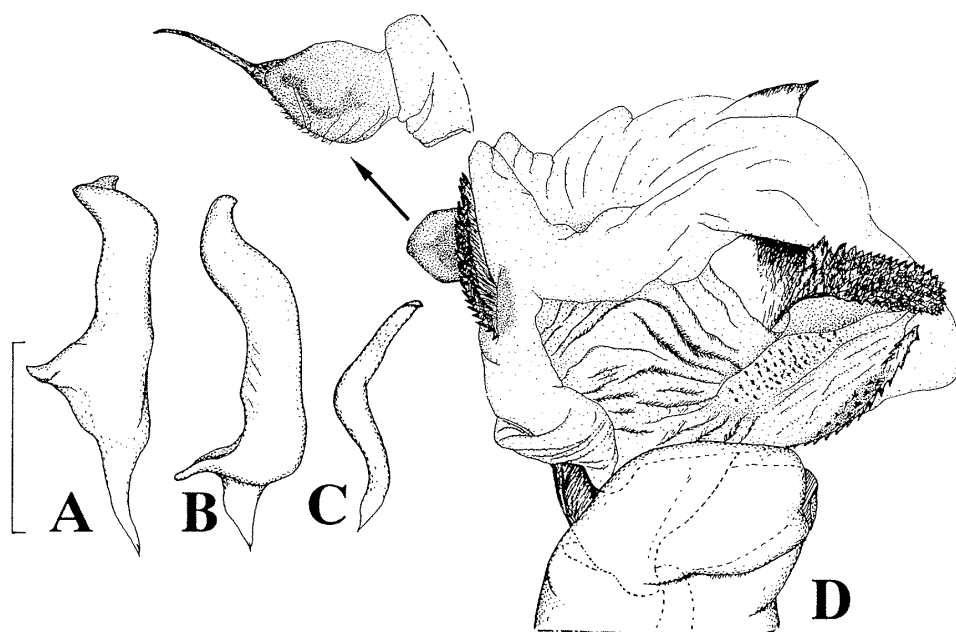


Fig. 5. Male genitalia of *Deraeocoris yasunagai* sp. nov. A–B, Left paramere; C, right paramere; D, phallus. Scale: 0.3 mm.

Ventral surface of abdomen shiny reddish brown.

Sensory lobe of left paramere with a distinct process; hypophysis weakly curved, relatively short and flattened, with a small hook. Right paramere short, slender, weakly curved. Spicule short, weakly curved. Apical sclerite short, with pointed apex. Lateral sclerite relatively short, thin, with a row of small spines. Median sclerite well developed, with small spines. Basal sclerite narrow, sparsely with minute spines.

Dimensions. Male: body length 4.6, head width 0.8, pronotal width 1.7 and width across hemelytra 2.1. Female: 5.3–5.7, 0.9, 2.0 and 2.4, respectively.

Holotype: ♂, Azuma Town, 200 m alt., Minamitakaki, Nagasaki Pref., 29. viii. 1993, (Light Trap), T. YASUNAGA. Type depository: Biological Laboratory, Hokkaido University of Education.

Paratypes: [Honshu] 1 ♀, Kasuga, Nara Pref., 22. vi. 1958, T. SHIBATA (OMNH); 1 ♀, Mt. Myohozan, Nachi-Katsuura Town, Wakayama Pref., 28–29. vii. 1978, M. OWADA and Y. NISHI (NSMT). [Kyushu] 5 ♂, same data as for the holotype (Biol. Lab., Hok. Univ. Educ. & UOP).

Distribution. Japan (Honshu, Kyushu).

This new species is closely related to *D. pallidicornis* JOSIFOV, from which it is easily distinguished by a dorsal dark stria and well-developed protuberance of the sensory lobe of the left paramere.

The specific name is dedicated to Dr. Tomohide YASUNAGA who collected the type material and recognized this species as undescribed one.

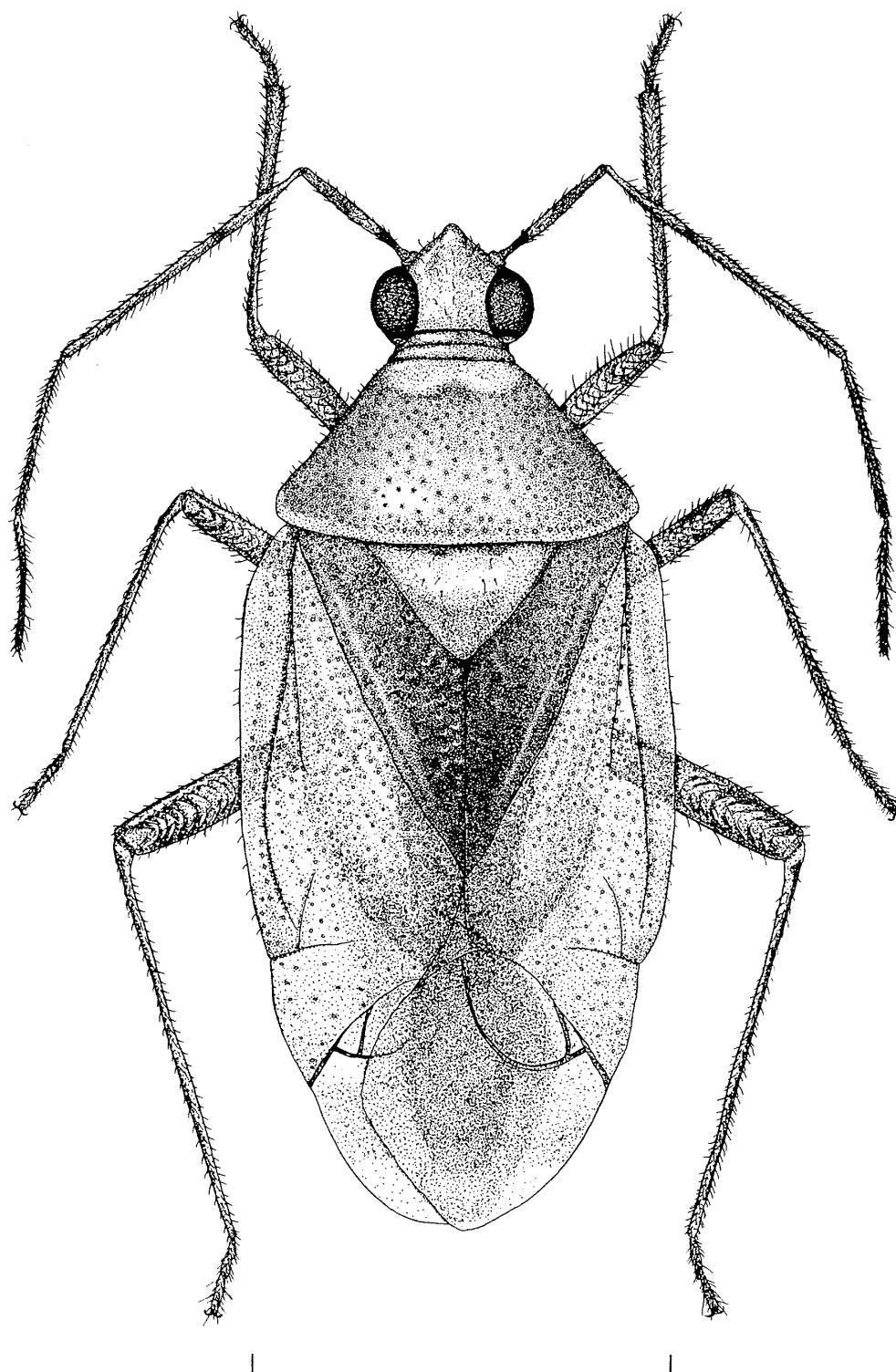


Fig. 6. *Deraeocoris yasunagai* sp. nov., holotype male. Scale: 2 mm.

Acknowledgements

I especially thank Prof. T. YASUDA, Drs. S. MORIUTI, M. ISHII and T. HIROWATARI (UOP), who gave me many critical advices and valuable suggestions in the course of the present study. My cordial thanks are due to Dr. S. MIYAMOTO (Fukuoka City) for his kind advice and encouragement. I am grateful to Dr. T. YASUNAGA (Biological Laboratory, Hokkaido University of Education) for his critical reading of the manuscript.

The specimens used in this study were loaned from and/or donated by the following institutions or persons, to whom I am much indebted: Dr. T. YASUNAGA, Dr. T. MATSUMURA (NIAES), Mr. M. TOMOKUNI (NSMT), Mr. Y. MIYATAKE (OMNH), Mr. K. YOSHIZAWA (Kyushu University) and Dr. T. HIROWATARI.

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(Received September 3, 1994, Accepted January 30, 1995)